Canal & River Trust

Explorers

Understanding hydraulics

canalrivertrust.org.uk/explorers

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Overview

- What are hydraulics?
- How do we use hydraulics?

What are Hydraulics?

Hydraulic systems use an **incompressible** liquid like water.

Incompressible means you cannot squash it.

What are Hydraulics?

Hydraulics transfer forces from one place to another through a liquid.

We can control the strength of forces to be more useful

What are Hydraulics?

Liquids have a fixed volume meaning they always take up the same space.

Gasses expand and can be squashed to change their volume.

Experiment

You will need two empty bottles and their lids.

Leave one bottle empty and fill one bottle with water

Make sure you screw the caps on tightly.

Experiment

Can you squash a bottle filled with air?

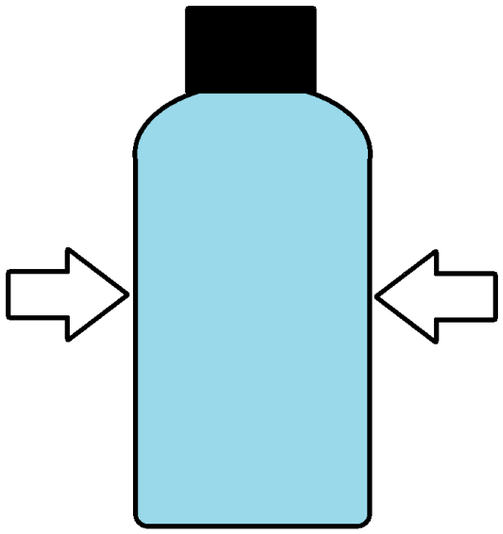
Can you squash a bottle filled with water?

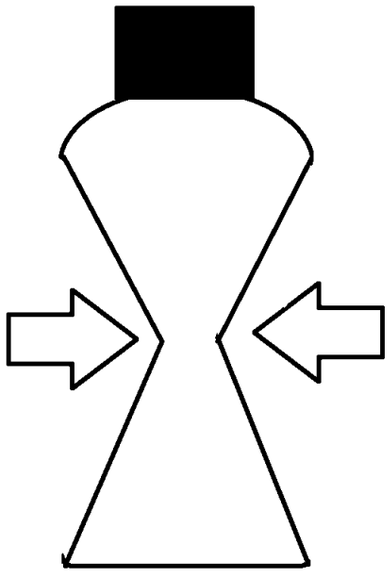
Can you describe what you found out?

If your bottle of water isn't totally full you might be squashing the air left inside

Understanding

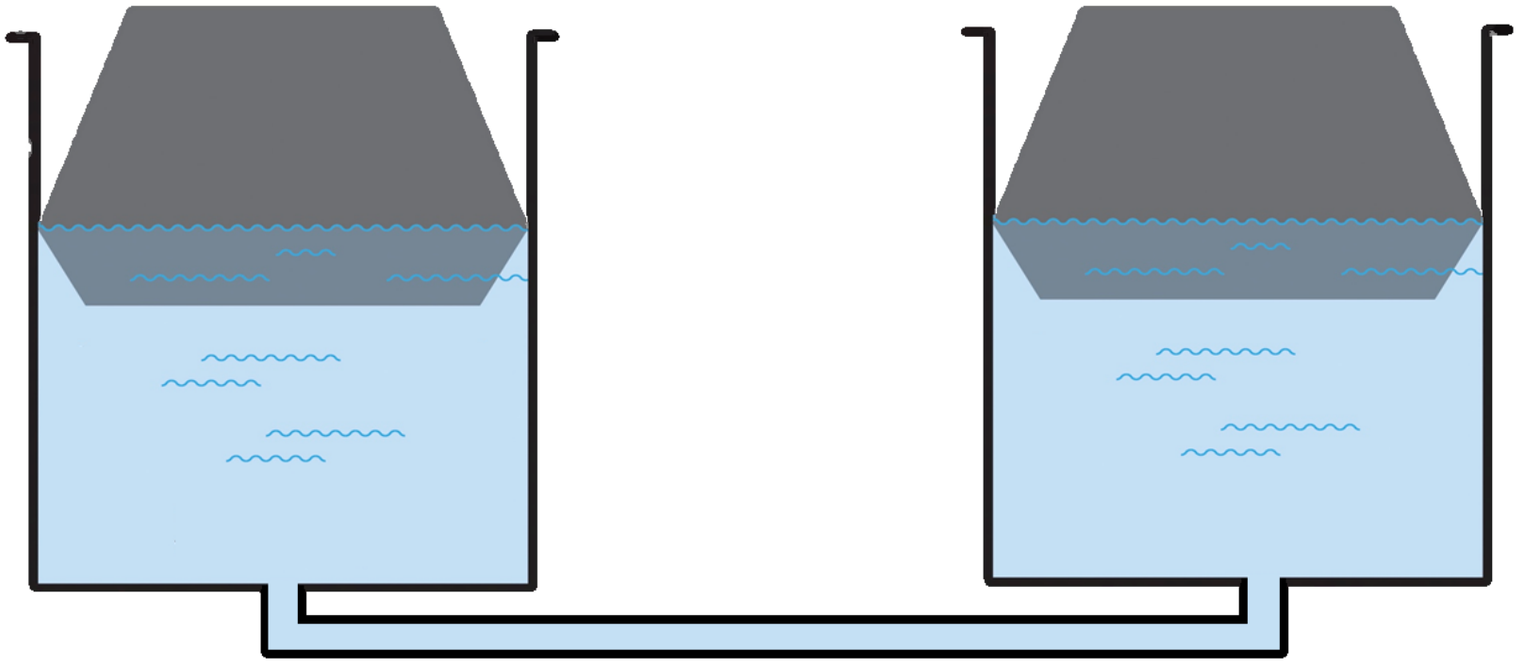
You could not squash the water bottle because there was nowhere for the water to go





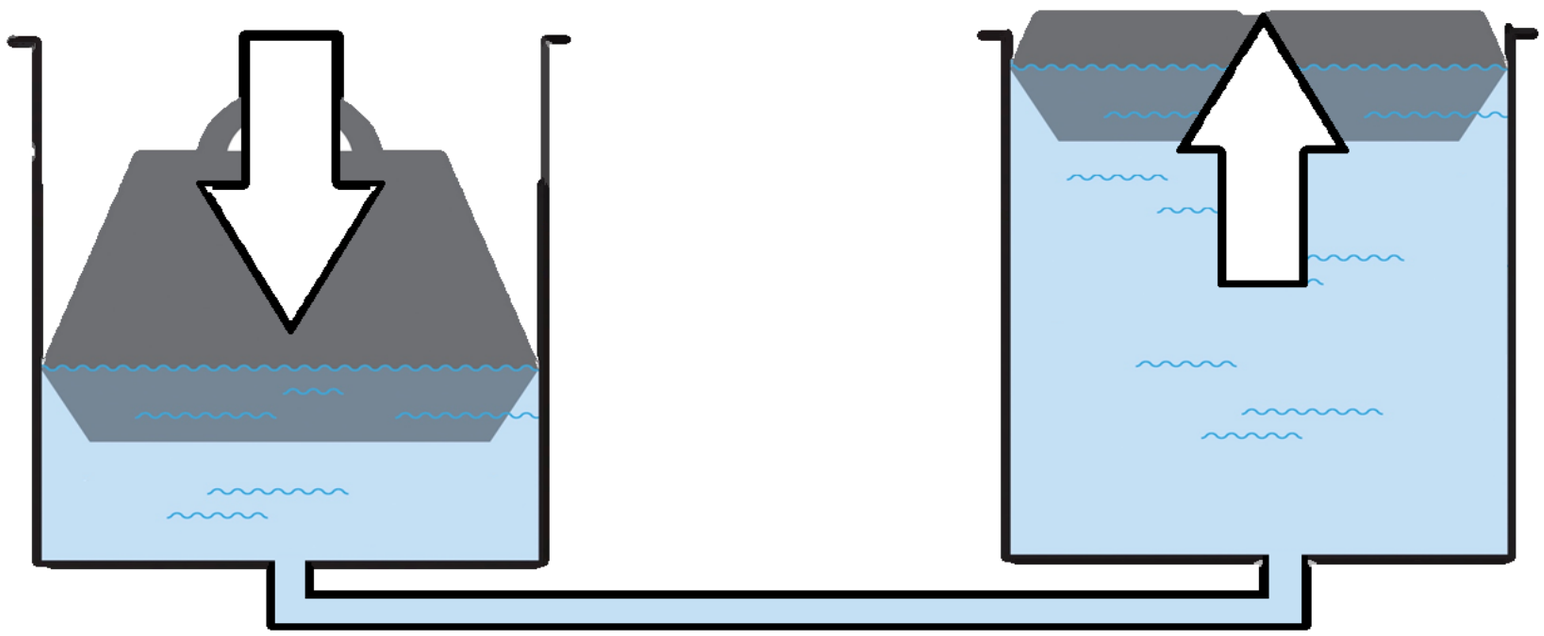
You can squash air so the volume of the bottle got smaller

How Hydraulics work



Using a fixed volume of water we can transfer forces from one place to another.

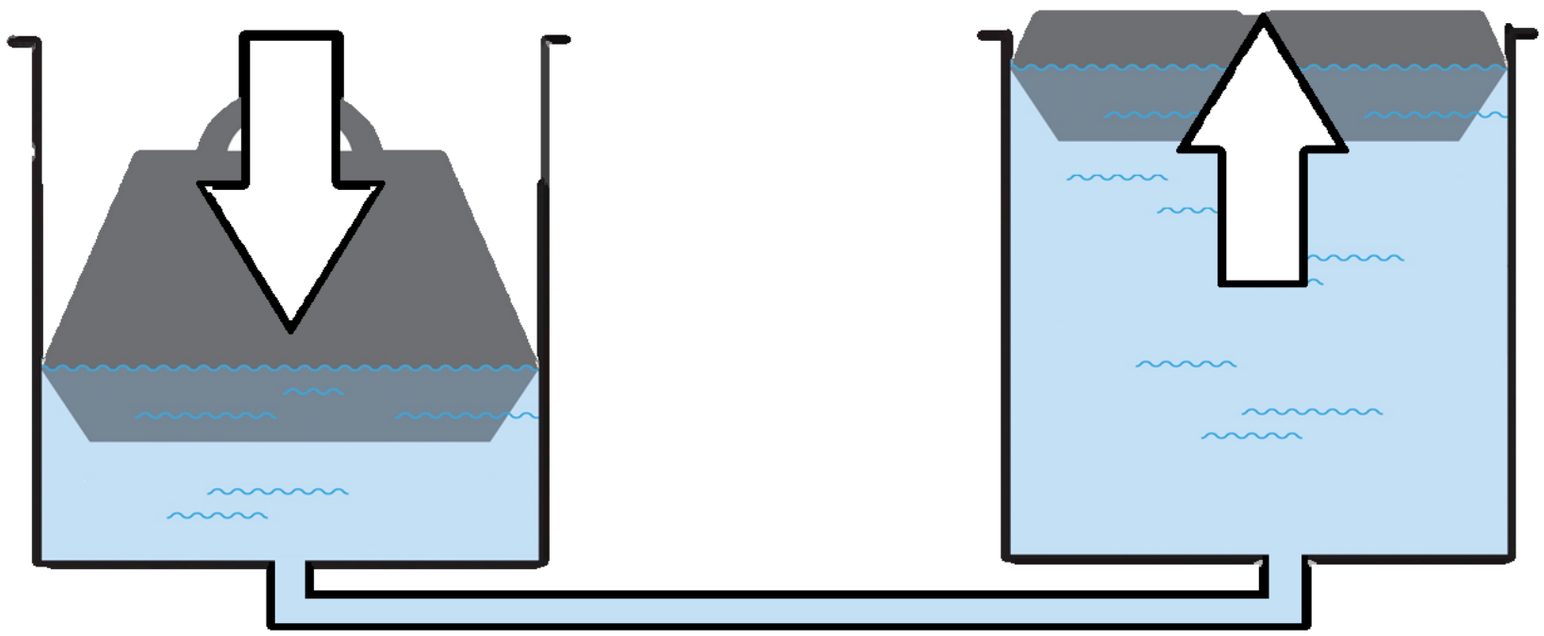
Understanding



If we push down on one side the liquid flows through the pipe and pushes up on the other side

Remember water always takes up the same amount of space

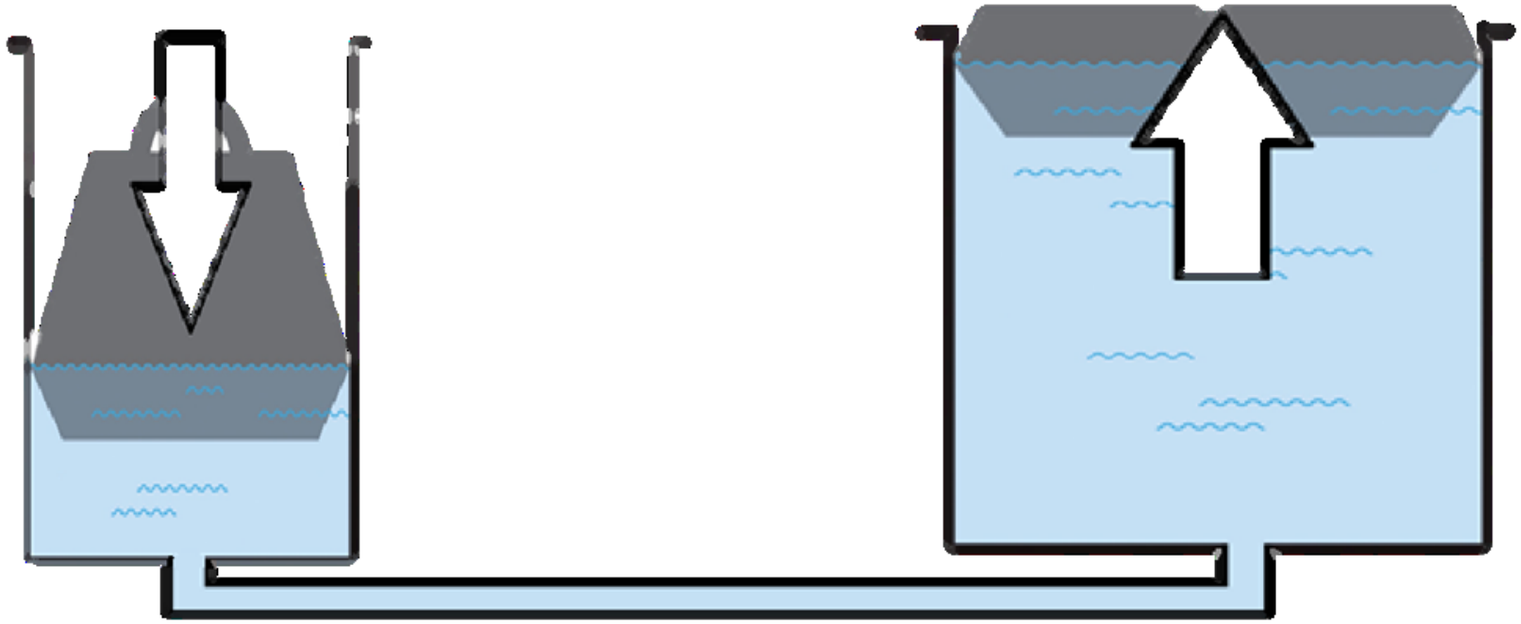
Extension Activity



Connecting syringes together you can transfer force from one syringe to the other.

Try and keep as much air out of the system as possible

Ex



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you change the size of the syringes.

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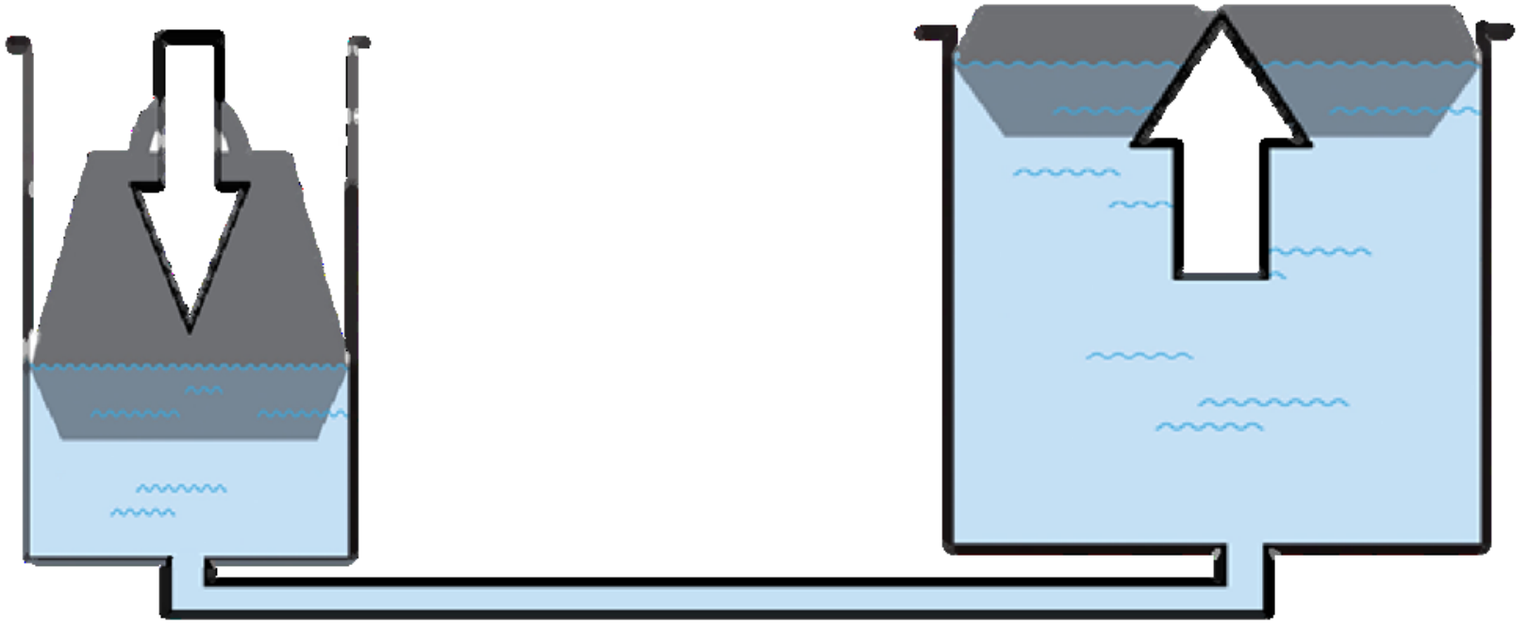
yourself stronger or weaker?

Ex



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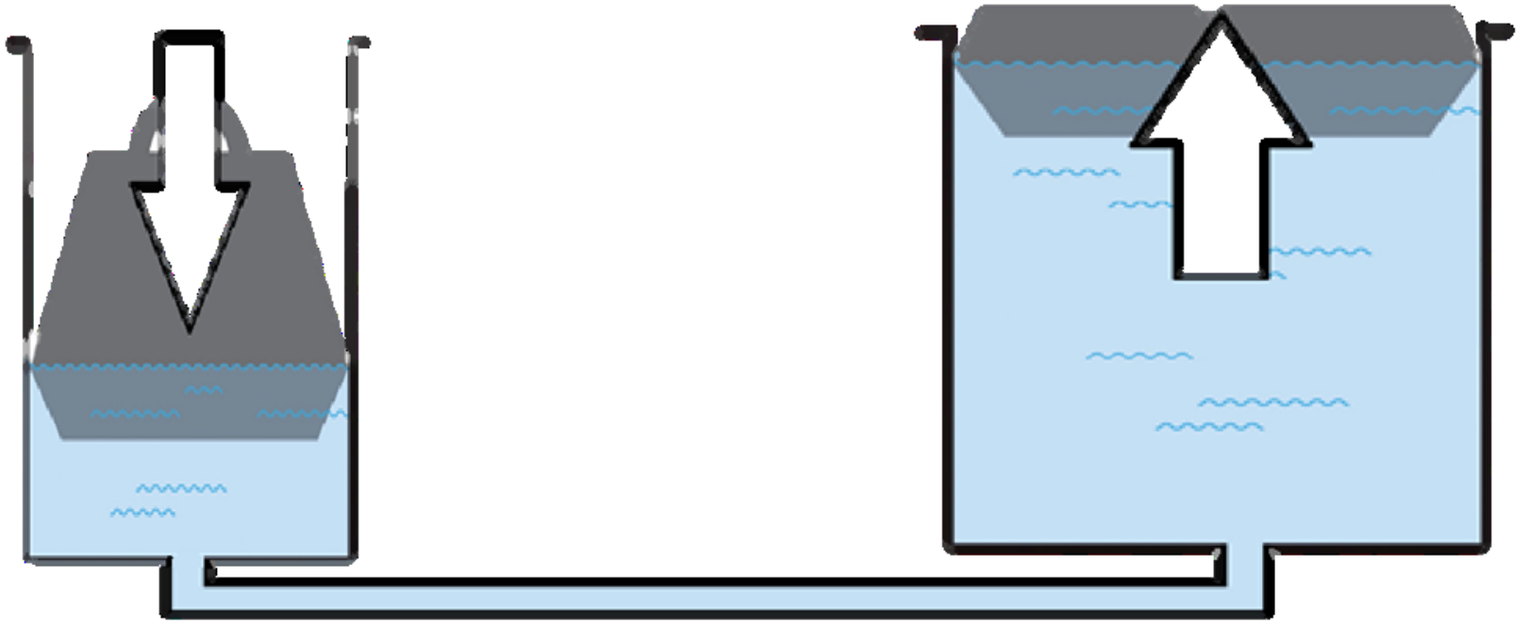
the same
distance?

Which combination is easiest?

Ex



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results and make sure it is a fair test?

ribe what you have seen?